CLAIMS

1. An optical head comprising:

an objective lens supported for movement;

a light source for radiating a light beam;

light separating means for separating the light beam radiated from said light source and a reflected light beam from an optical recording medium from each other;

light detecting means for receiving said reflected light beam from said optical recording medium separated by said light separating means; and

spot shape correction means arranged between said objective lens and said light detecting means;

said spot shape correction means correcting part or all of spots formed by said reflected light beam on said light detecting means so that the spot diameter in a direction of traversing a track on said optical recording medium will be larger than the spot diameter in a direction along said track.

2. The optical head according to claim 1 wherein said spot shape correction means corrects part or all of said spots formed by said reflected light beam on said light detecting means so that the spot diameter in a direction along the track on the optical recording medium will be approximately minimum.

3. The optical head according to claim 1 wherein said spot shape correction means includes a cylindrical lens.

4. The optical head according to claim 1 wherein said spot shape correction means

includes a toric lens.

5. The optical head according to claim 1 wherein said spot shape correction means includes a hologram device.

6. The optical head according to claim 1 wherein said spot shape correction means is unified to said light detecting means.

7. The optical head according to claim 1 wherein a hologram device for affording power to the diffracted light is provided between said light separating means and the light detecting means and wherein focussing error detection is performed by spot size detection.

8. The optical head according to claim 7 wherein said hologram device has a power to be afforded for focussing error detection for a diffracted light larger than the power to be afforded in other directions.

9. The optical head according to claim 1 wherein said light detecting means for receiving said reflected light beam includes at least one set of light receiving sections, obtained on splitting, and wherein at least one of tracking error signals, address signals and clock signals is obtained by a push-pull method using said light receiving sections.

10. The optical head according to claim 1 wherein multiplication factor differential generating means is provided between said light separating means and said objective lens and wherein, by said multiplication factor differential generating means, the multiplication factor in the direction used for focussing error detection is set to be larger than the multiplication factor in other directions.

11. The optical head according to claim 10 wherein said multiplication factor differential generating means includes an anamorphic prism.

12. The optical head according to claim 1 wherein divergence angle converting means for converting an incident numerical aperture to light separating means to a smaller value is provided between said light source and said light separating means.

13. The optical head according to claim 12 wherein said divergence angle converting means includes a coupling lens.

14. A light receiving and emitting device comprising:

a light source for radiating a light beam;

light separating means for separating the light beam radiated from said light source and a reflected light beam from an optical recording medium from each other;

light detecting means for receiving said reflected light beam from said optical recording medium separated by said light separating means; and

spot shape correction means arranged between said light separating means and said light detecting means;

said spot shape correction means correcting part or all of spots formed by said reflected light beam on said light detecting means so that a spot diameter in a direction of traversing a track on said optical recording medium will be larger than the spot diameter in a direction along said track.

15. The light receiving and emitting device according to claim 14 wherein said spot shape correction means corrects part or all of said spots formed by said reflected light

beam on said light detecting means so that the spot diameter in a direction along the track on the optical recording medium will be approximately minimum.

16. The light receiving and emitting device according to claim 14 wherein said spot shape correction means includes a cylindrical lens.

17. The light receiving and emitting device according to claim 14 wherein said spot shape correction means includes a toric lens.

18. The light receiving and emitting device according to claim 14 wherein said spot shape correction means includes a hologram device.

19. The light receiving and emitting device according to claim 14 wherein a hologram device for affording power to a diffracted light is provided between said light separating means and the light detecting means and wherein focussing error detection is performed by spot size detection.

20. The light receiving and emitting device according to claim 19 wherein said hologram device has a power to be afforded for focussing error detection for the diffracted light larger than the power to be afforded in other directions.

21. The light receiving and emitting device according to claim 14 wherein said light detecting means for receiving said reflected light beam includes at least one set of light receiving sections, obtained on splitting, and wherein at least one of tracking error signals, address signals and clock signals is obtained by a push-pull method using said light receiving sections.

22. The light receiving and emitting device according to claim 14 wherein

multiplication factor differential generating means is provided between said light separating means and said objective lens in order to radiate a converged light on said optical recording medium, and wherein, by said multiplication factor differential generating means, the multiplication factor in the direction used for focussing error detection will be larger than the multiplication factor in other directions.

23. The light receiving and emitting device according to claim 22 wherein said multiplication factor differential generating means includes an anamorphic prism.

24. The light receiving and emitting device according to claim 14 wherein divergence angle converting means for converting an incident numerical aperture to light separating means to a smaller value is provided between said light source and the light separating means.

25. The light receiving and emitting device according to claim 24 wherein said divergence angle converting means includes a coupling lens.

26. The light receiving and emitting device according to claim 14, further comprising at least two optical paths from said light separating means to light detecting means, wherein focussing error detection and push-pull detection are performed on one of said optical paths and DPD detection is performed on the other optical path.

27. A recording and/or reproducing apparatus for an optical recording medium comprising:

means for rotationally driving an optical recording medium;

an optical head for illuminating light via an objective lens supported for

movement relative to a rotating optical recording medium and for detecting a light beam reflected from a signal recording surface of said optical recording medium through said objective lens by light detecting means;

a signal processing circuit for generating playback signals based on detection signals from said light detecting means; and

a servo circuit for causing movement of said objective lens based on said detection signals from said light detecting means;

said optical head including

a light source for radiating a light beam, light separating means for separating the light beam radiated from said light source and a reflected light beam from said optical recording medium from each other;

light detecting means for receiving said reflected light beam from said optical recording medium separated by said light separating means; and

spot shape correction means arranged between said objective lens and said light detecting means for correcting part or all of spots formed by said reflected light beam on said light detecting means so that a spot diameter in a direction of traversing a track on said optical recording medium will be larger than the spot diameter in a direction along said track.

28. The recording and/or reproducing apparatus for the optical recording medium according to claim 27 wherein said spot shape correction means corrects part or all of said spots formed by said reflected light beam on said light detecting means so that the

spot diameter in a direction along the track on the optical recording medium will be approximately minimum.

29. The recording and/or reproducing apparatus for the optical recording medium according to claim 27 wherein said spot shape correction means includes a cylindrical lens.

30. The recording and/or reproducing apparatus for the optical recording medium according to claim 27 wherein said spot shape correction means includes a toric lens.

31. The recording and/or reproducing apparatus for the optical recording medium according to claim 27 wherein said spot shape correction means includes a hologram device.

32. The recording and/or reproducing apparatus for the optical recording medium according to claim 27 wherein said spot shape correction means is unified to said light detecting means.

33. The recording and/or reproducing apparatus for the optical recording medium according to claim 27 wherein a hologram device for affording power to the diffracted light is provided between said light separating means and the light detecting means and wherein focussing error detection is performed by spot size detection.

34. The recording and/or reproducing apparatus for the optical recording medium according to claim 33 wherein said hologram device has a power to be afforded for the focussing error detection for the diffracted light larger than the power to be afforded in other directions.

35. The recording and/or reproducing apparatus for the optical recording medium according to claim 27 wherein said light detecting means for receiving said reflected light beam includes at least one set of light receiving sections, obtained on splitting, and wherein at least one of tracking error signals, address signals and clock signals is obtained by a push-pull method using said light receiving sections.

36. The recording and/or reproducing apparatus for the optical recording medium according to claim 27 wherein multiplication factor differential generating means is provided between said light separating means and said objective lens and wherein, by said multiplication factor differential generating means, the multiplication factor in the direction used for focussing error detection is set to be larger than the multiplication factor in other directions.

37. The recording and/or reproducing apparatus for the optical recording medium according to claim 36 wherein said multiplication factor differential generating means includes an anamorphic prism.

38. The recording and/or reproducing apparatus for the optical recording medium according to claim 27 wherein divergence angle converting means for converting an incident numerical aperture to said light separating means to a smaller value is provided between said light source of said optical head and the light separating means.

39. The recording and/or reproducing apparatus for the optical recording medium according to claim 38 wherein said divergence angle converting means includes a coupling lens.

40. A recording and/or reproducing apparatus for an optical recording medium comprising:

means for rotationally driving said optical recording medium;

an optical head for illuminating light through an objective lens supported for movement relative to a rotating optical recording medium and for detecting a light beam reflected from a signal recording surface of said optical recording medium through said objective lens by light detecting means;

a signal processing circuit for generating playback signals based on detection signals from said light detecting means; and

a servo circuit for causing movement of said objective lens based on said detection signals from said light detecting means;

said optical head including

a light source for radiating a light beam;

light separating means for separating the light beam radiated from said light source and a reflected light beam from said optical recording medium from each other;

light detecting means for receiving said reflected light beam from said optical recording medium separated by said light separating means; and

a light receiving/emitting device including spot shape correction means arranged between said objective lens and said light detecting means for correcting part or all of spots formed by said reflected light beam on said light detecting means so that a spot diameter in a direction of traversing a track on said optical recording medium will be

larger than the spot diameter in a direction along said track.

41. The recording and/or reproducing apparatus for the optical recording medium according to claim 40 wherein said optical head comprises spot shape correction means for correcting part or all of said spots formed by said reflected light beam on said light detecting means so that the spot diameter in the direction along the track on the optical recording medium will be approximately minimum.

42. The recording and/or reproducing apparatus for the optical recording medium according to claim 40 wherein said spot shape correction means of said optical head includes a cylindrical lens.

43. The recording and/or reproducing apparatus for the optical recording medium according to claim 40 wherein said spot shape correction means of said optical head includes a toric lens.

44. The recording and/or reproducing apparatus for the optical recording medium according to claim 40 wherein said spot shape correction means of said optical head includes a hologram device.

45. The recording and/or reproducing apparatus for the optical recording medium according to claim 40 wherein said light receiving/emitting device provides a hologram device for affording power to the diffracted light between said light separating means and the light detecting means and wherein focussing error detection is performed by spot size detection.

46. The recording and/or reproducing apparatus for the optical recording medium

according to claim 45 wherein said hologram device has a power to be afforded for focussing error detection for the diffracted light larger than the power to be afforded in other directions.

47. The recording and/or reproducing apparatus for the optical recording medium according to claim 40 wherein said light detecting means for receiving said reflected light beam includes at least one set of light receiving sections, obtained on splitting, and wherein at least one of tracking error signals, address signals and clock signals is obtained by a push-pull method using said light receiving sections.

48. The recording and/or reproducing apparatus for the optical recording medium according to claim 40 wherein said light receiving/emitting device provides multiplication factor differential generating means between said light separating means and said objective lens in order to radiate a converged light beam on said optical recording medium, and wherein, by said multiplication factor differential generating means, the multiplication factor in the direction used for focussing error detection is larger than the multiplication factor in other directions.

49. The recording and/or reproducing apparatus for the optical recording medium according to claim 48 wherein said multiplication factor differential generating means includes an anamorphic prism.

50. The recording and/or reproducing apparatus for the optical recording medium according to claim 40 wherein said light receiving/emitting device provides divergence angle converting means for converting the incident numerical aperture to said light

separating means to a smaller value between said light source and the light separating means.

51. The recording and/or reproducing apparatus for the optical recording medium according to claim 50 wherein said divergence angle converting means includes a coupling lens.

52. The recording and/or reproducing apparatus for the optical recording medium according to claim 40 wherein said light receiving/emitting device provides at least two optical paths from said light separating means to light detecting means and wherein focussing error detection and push-pull detection are performed on one of said optical paths and DPD detection is performed on the other optical path.